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Comparing the Effect of Simulation and Video-based Education on Mothers' Self-Efficacy in Bathing Preterm Infants

Asadollahi Maliheh[1], Jebraeili Mahnaz[2], Mohammadpoorasl Asghar[3], Shamshiri Mahmood[4], and Karimipoor Roghayeh[5]*

[1]Instructor, Department of Pediatric Nursing, School of Nursing and Midwifery, Tabriz University of Medical Sciences, Tabriz, Iran
[2]PhD candidate, Department of Pediatric Nursing, School of Nursing and Midwifery, Tabriz University of Medical Sciences, Tabriz, Iran
[3]Tabriz Health Services Management Research Center, Tabriz University of Medical Sciences, Tabriz, Iran
[4]Department of Medical-Surgical Nursing, School of Nursing and Midwifery, Ardabil University of Medical Sciences, Ardabil, Iran
[5] Master student in Neonatal Intensive Care Nursing, Department of Pediatric Nursing, School of Nursing and Midwifery, Tabriz University of Medical Sciences, Tabriz, Iran
**CorrespondingEmail:r.karimipoor@yahoo.com*

ABSTRACT

Self-efficacy is the belief of person about his or her ability and capacity to accomplish a task or to deal with the challenges of life. Since, Self-efficacy is an important factor for mothers who are caring their children. Aim: This study aimed to compare the effect of a simulation-based and video-base methods on mothers' self-efficacy in bathing their preterm infants. Methods and Material: In this Randomized Controlled Clinical Trial, 90 first time mothers were chosen by convenience sampling method and divided into three groups using simple random sampling. Self-efficacy questionnaires were completed by mothers before the intervention. In simulation group, infant bathing training went on 15 minutes for the group on moulage and in the video group the training went on for 15 minutes for the group by playing the video. Control group did not receive any training in this regard. Again, after 45 hours of intervention and a week after discharge mothers' self-efficacy in all three groups were evaluated. In order to evaluate the change at different intervals repeated measures analysis of variance was conducted on the data. Results: Results showed that mothers' self-efficacy before and after the intervention have a significant increase in both simulation and video groups (P<0.001). Mothers' self-efficacy score in simulation and video groups showed a significant difference with control group (P<0.001). But the Tukey's test showed no significant difference between simulation and educational video group (P=0.159). Conclusions: Based on the findings, both simulation and video helped the mothers to increase their self-efficacy in bathing preterm infant. Thus, health centers can adopt either method for training mothers according to their facilities or equipment for better preparing them for looking after their preterm infants.

Keywords: Simulation, Educational video, Mother's self-efficacy, Preterm infant

INTRODUCTION

Preterm labor is the birth of an infant between 20-36 weeks of pregnancy. As a result, many infants do not survive or have an increased risk of health problems and they need specific care. Preterm birth rates have been reported to range from 6% to 7% of live births in some developed countries [1]. But based on statistics of Tehran Medical Science University rates are higher and estimated to be 7.2 percent of all labors in our country [2]. The use of modern technology and medical science developments regarding care of preterm infants guarantees biological

survival of these infants [3]. This means that these infants may need to be looked after in a neonatal intensive care unit for longer time [4]. Parenting these newborns is an exceptional experience with long term outcomes so that the child-parents and parents' future relationship might be affected and the mother might not be prepared mentally, physically and emotionally to accept the incidence. So parents need support to adapt [5, 6]. On the other hand, the infants is not as responsive as a full term infant in parent-child interaction, so their parents face more problems in feeling parenting adequacy and self-efficacy [7].

Preterm infants often need extra care and support after discharge. Transition from hospital to home is a challenge for parents because they are fully responsible for the care at home [8]. Rabelo and colleagues showed that preterm infants' mothers often do not feel competent and qualified [9]. Therefore, mothers need more support for looking after the infant [10]. For desired care mother must have enough self-efficacy feeling to look after the infant [11]. Bandura in 1997 defined self-efficacy as an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments. Self-efficacy reflects confidence in the ability to exert control over one's own motivation, behavior, and social environment. It is a determinant factor for motivation [10]. Bandura believes that with applying appropriate training solutions and interventions we can help empower people and increase self-efficacy [12]. Kim an colleagues showed that training programs about pregnancy and labor has a positive impact on knowledge of pregnancy, infant care and self-efficacy after labor and among inexperienced mothers [13]. According to the literature training has a positive effect on self-efficacy but it's not obvious how modern trainings affect self-efficacy. One of these training methods is simulation. According to Hwang and Kim, simulation training is more effective in learning because of creating a more virtual environment and the possibility of repeating action. Making mistakes without worrying about injury to patient, active learning, opportunity for giving prompt feedback, controlling the learning environment and thought improvement are among the advantages of this method [14].

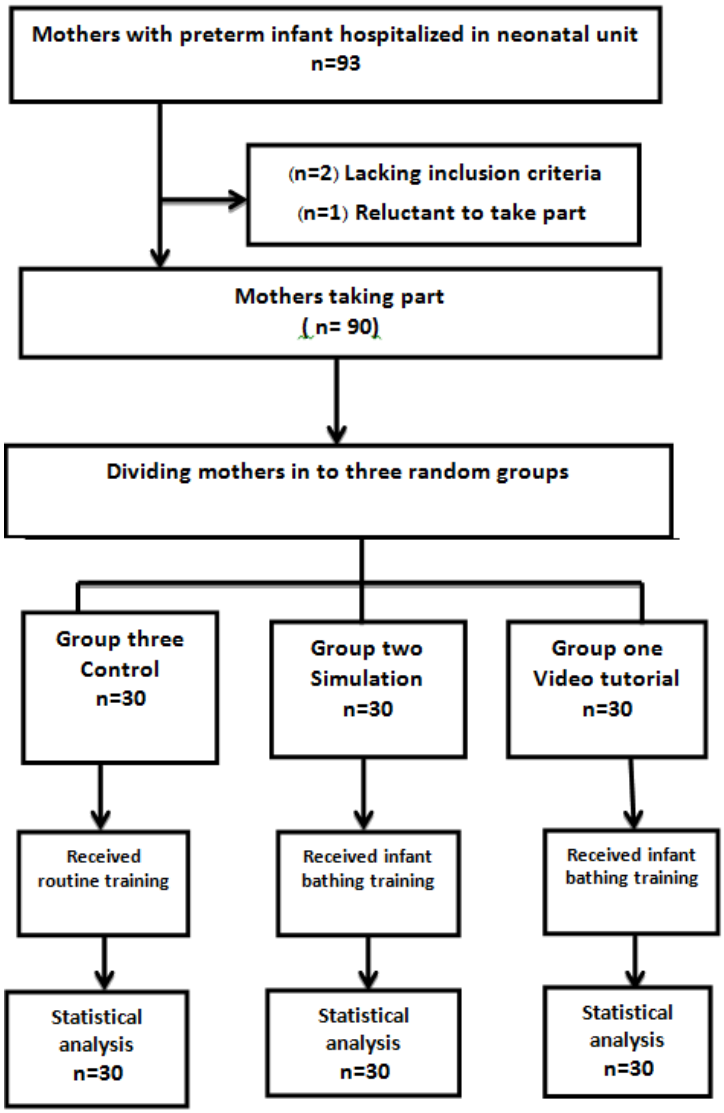
Modern training specially simulation is widely used but it is not welcomed in clinical training of universities and hospitals and training is still based on giving speech. Considering the complexity of clinical procedures and action based nature of nursery position with the necessity of providing high quality services, modern training methods specially simulation can help in better decision making and performing clinical care with higher quality [15]. Another training method is using video. Studies have shown the positive effect of audio visual aids in comparison with traditional methods on consciousness, satisfaction and stress reduction [16-18]. Due to lack of knowledge and skill, after discharge, parents might make many mistakes in care [8] so nurses should plan a training program during hospitalization period for increasing self-efficacy after discharge. One of the important aspects of looking after a preterm infant is bathing. Studies show that premature infants face behavioral and physiological disruptions during bathing and afterwards. The disruptions include increased heartbeat, increased vascular oxygen demand, and change in behavioral movement symptoms and reduced oxygen saturation [19]. Researcher's clinical experiences show that mothers have problem in bathing a premature, light weight and small infant. Since the issue of bathing the infant has not been investigated properly [20]. Therefore, researchers decided to compare the effect of simulation-based and video-based educations on mothers' self-efficacy for bathing their preterm infants.

MATERIALS AND METHODS

This is Randomized Clinical Trial research designed in pretest and posttest method. The study was approved by committee of ethics in Tabriz Medical University and was registered in clinical trial website IRCT(201408195168N6) and then perfomed in neonatal care unit of Booali hospital in Ardabil a subsidiary of Medical University.

Prior to data collection all the participants well informed about the procedure and they also ensured the procedure does not impose any harms of complications. The intervention was in accordance with the ethical standards of experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000.

Ninety mothers with the following eligibility criteria participated in the study during a four-month period from 22nd of November 2014 to 22nd of March 2015: mothers of 34-37 weeks' infants ready for discharge, literate, completing informed consent and etc. If a mother attended evaluations less than two times she was excluded. The sample size was estimated 90 based on primary study, through using mean, and confidence coefficient equal to 95 percent and power equal to 80 percent. Simulation group consisted of 30 members, video group consisted of 30 members and control group consisted of 30 members chosen using convenient sampling and then divided into three groups using random sampling method and lottery. The flowchart 1 shows the sampling procedure and allocation of the participants into three groups.



Flowchart 1: study participants and their allocation into the three study groups

Researcher started training mothers about bathing the infant for 15 minutes in simulation group in a calm environment equipped with training tools (hospital conference room). The researcher practically taught all phases of bathing infant on moulageand at the end provided a practice opportunity to mothers. In video tutorial group the training went on for 15 minutes. Because the video was recorded in original language the researcher explained every part for mothers. The video was made based on Epworth community's bathing training guideline for mothers. In both methods the content was based on training curriculum and based on the book Pediatric Nursing Procedures 2003 [21].

Mothers in control group received the routine training. In all three groups self-efficacy was evaluated by completing mothers' self-efficacy questionnaire in bathing preterm infants at three intervals (48-72 hours of hospitalization, 48 hours after intervention and a week after discharge). In this study the questionnaires were completed by mothers there was no blinding and only the person responsible for analyzing the data was unaware of groups. In this study a two-part questionnaire was used to record the data: The first part was related to mothers' demographic information such as closed questions about age, occupation, education, salary, husband's occupation, husband's education and etc.

The second part of questionnaire was the tool for measuring self-efficacy among mothers of preterm infants about bathing the infant which was designed by the researcher and based on content of the book Pediatric Nursing Procedures 2003 and included 27 questions regarding phases of bathing infants including: preparing bathing equipment before starting, keeping the room temperature of 26-27$^{\circ C}$, keeping the water temperature of 37-37.5$^{\circ C}$, pouring the water to have a depth of 5 inches or an amount of water that fully covers the infants shoulders, washing

face and head before placing the infant in water, cleaning his/her face with clean dump cloth, cleaning his/her eyes with dump cloth from the inner corner to outside, drying face, wearing the hat, placing the infant in water while supporting head and shoulders, washing neck, nipple, body and genitals with soupy cloth, drying quickly and wearing clothes.

All of the questions started with the phrase "I can always..." Mothers checked their ability in doing each and every step on Likert scale (I'm not confident at all, I have little confidence, I have medium confidence, I'm confident, I'm completely confident). All of the questions were designed with positive tone based on Bandura self-efficacy theory. The minimum score of each question was 1 and the maximum was 5. The total score of self-efficacy in bathing preterm infants ranged from 27 to 135 and the mean for each group was reported.

Content validity (CVR, CVI) validated the tool and was proved by polling 10 nursing and midwifery professors in Tabriz University of Medical Sciences. For making it reliable first 20 mothers (excluding the research) studied and completed the questionnaire and the reliability coefficient was calculated using Cronbach's alpha coefficient for the whole questionnaire and was equal to 0.90. Data was gathered and analyzed with SPSS-21 software and descriptive statistical methods (mean, standard deviation, frequency, percentage). In order to evaluate the change in self-efficacy at different intervals repeated measures analysis of variance was used. P-value less than 0.05 was considered as significant.

RESULTS

In this study, 90 mothers with newborns with gestational ages of 34-37 weeks were studied in three groups. In table 1 demonstrate the descriptive statistics of the demographic variables in the three subject groups. one-way variance analysis test was used to compare mean and standard deviation in quantitative demographic variables. Results show that there is no significant statistical difference among groups in demographic variables. Chi-squared test was used to compare frequencies and frequency percentage in qualitative demographic variables and no significant difference was observed.

Table 1. Descriptive statistics about quantitative demographic variables in subject groups

Group / Mean & Standard Deviation	Simulation Group	Video Group	Control Group	Statistical Index
Mother's Age	23.87±4.2	25.07±4.35	24.83±6.25	F=0.48,P=0.620
Age at Marriage	21.13±3.73	22.23±3.46	21.30±3.97	F=0.760,P=0.471
Age at First Pregnancy	22.47±4.15	23.80±4.33	23.37±6.03	F=0.576,P=0.564
Infant Weight	2.27±0.87	2.30±0.88	2.27±0.86	F=0.015,P=0.985

Table 2 shows the mean and standard deviation of mothers' self-efficacy scores in bathing preterm infants at different intervals among three groups. This table show that the mean of self-efficacy in both intervention groups was rising at intervals.

Table2.Change in mothers' self-efficacy score among three groups at different intervals

Group	Time			Statistical Test
	Before Intervention	48h after Intervention	1week after Discharge	
Educational Video	63.53±12.49	83.60±14.06	98.90±17.00	
Simulation	64.57±17.42	92.63±15.83	108.40±14.24	
Control	63.60±13.61	63.30±14.38	6310±13.49	
Time				P-Value<0.001
Time*group				P-Value<0.001
Group*				P-Value<0.001

Repeated measures test showed that these difference are statistically significant (P<0.001). The Tukey's test showed that there is no significant difference between video group and simulation group (P=0.159) but there was a significant difference between video and simulation with control group (P<0.001). The results are depicted in figure 1.

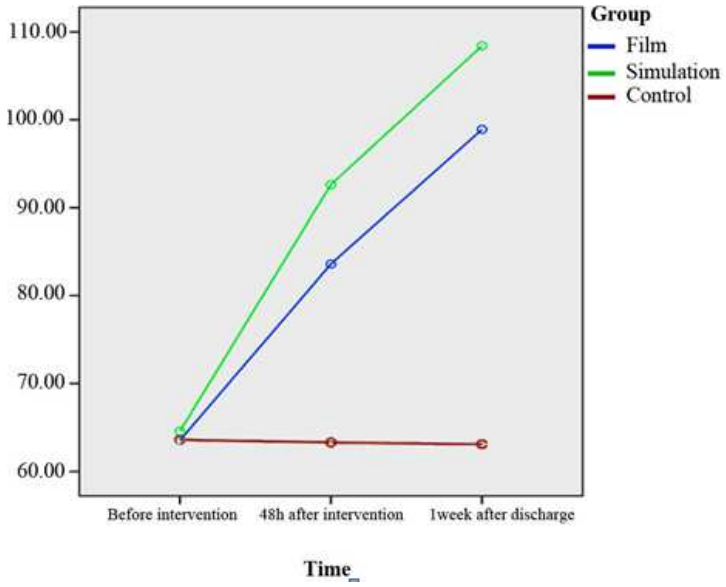


Figure1. Change in mothers' self-efficacy score among three groups at different intervals

DISCUSSION

This study aims at comparing the effect of simulation on moulage and educational video on mothers' self-efficacy for bathing preterm infants. Results show that simulation increases mothers' self-efficacy in this field so that the mean of self-efficacy in this group was statistically significant difference compared with control group. Merriman and colleagues conducted a research with the aim of comparing the effect of simulation and traditional training on self-efficacy in evaluating the circumstances of malignant condition patients. Results showed that the score of self-efficacy significantly improved after the training with simulation [22]. Christian et al evaluated the effects of simulation on self-efficacy about controlling toxemia of pregnancy in Certified Nurse-Midwife in three stages before and after the intervention and 8 weeks after the training. Results showed that Not only the self-efficacy has improved dramatically after the intervention but it is preserved as time passed [23]. Also a study titled simulating classroom for self-efficacy of nursing students regarding health training has been conducted. Results showed that Self-efficacy scores have improved dramatically after two sessions of role play (P=0.001) [24].

The results of the present study also showed that training with video increases mothers' self-efficacy in bathing preterm infants so that the mean of self-efficacy was statistically significant difference in comparison with control group. An Irish study was conducted in this field aiming at using online clips to enhance nursing students' self-efficacy in face of hard situations. Results show that video clips are effective supportive materials and successfully increase students' self-efficacy in hard situations. The results of this study are in consistent with ours [25]. Esmaeli et al. (2004) reported that using visual Medias like videos is advantageous for training viewers and patients [26]. Results of Aghvami et al. (2011) showed that training with video is effective in the quality of life for children with asthma. So this method is suggested for maintaining and improving the quality of life for such kids [27]. These results prove ours and all of them prove the positive effect of simulation and video on self-efficacy and learning. In this study the Tukey's test showed that there is no significant difference between simulation and educational video regarding the self-efficacy score (P=0.1590). Malik et al. conducted a study in India titled comparing simulation and video as a means of training. Results showed that both methods positively affected learning among students but there was no significant difference between the two methods. This study suggests that some students learn better either with simulation or video and this relies on the comprehensive perception of each method [28].

One of the limitations for this study was to simultaneous reception and training of mothers in all three groups. They could transfer their acquired knowledge from the sessions to each other and this could affect our results. It is suggested to conduct more studies for comparing the effect of other training methods or compound techniques (video plus simulation) on mothers' self-efficacy for bathing preterm infants and other caring aspects.

CONCLUSION

This study showed that simulation and educational video have the same effect on improving mothers' self-efficacy for bathing preterm infants. Therefore, we can conclude that based on the findings, both simulation and video

tutorial helped in increasing mothers' self-efficacy in bathing preterm infant. Thus training centers can adopt either method for training mothers for better bathing of their infants.

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